

REMARKS

Favorable reconsideration is respectfully requested.

The claims are 1 to 11.

The above amendment is responsive to the objection to claim 4.

Claims 1 to 11 have been rejected under 35 U.S.C. 102(b) as anticipated by Barton et al. (Barton).

This rejection is respectfully traversed.

Barton discloses, as already discussed in the previous response, an oxidation, which proceeds through cerium mediated singlet oxygen formation from hydrogen peroxide, since cerium(IV)oxide is used in more than stoichiometric amounts. Further, Barton uses a heterogenous catalyst, which is no longer claimed herein.

The process herein deals with catalytic methods for performing singlet oxygenations based on hydrogen peroxide (see page 6, lines 14 to 17, The amount of catalyst used....).

In addition, the molybdate catalyzed conversion of compound V into compound VI with H_2O_2 according to Barton **does NOT proceed via singlet oxygen**. Under the employed conditions in which a very large excess of H_2O_2 is used (5 mL for 50 mg substrate!), molybdate reacts to form a tetraperoxo species, which is an inefficient generator of singlet oxygen. The fact that with CeO_2 instead of molybdate, compound V is indeed converted into the expected singlet oxygen product VII instead of VI, also points out that molybdate does not catalyze formation of singlet oxygen from H_2O_2 under the employed conditions.

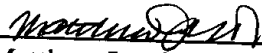
Therefore, the present process is both novel over and unobvious from the Barton reference.

No further issues remaining, allowance of this application is respectfully requested.

If the Examiner has any comments or proposals for prosecution, please contact the undersigned at the telephone number below.

Respectfully submitted,

Jean-Marie AUBRY et al.

By: 
Matthew Jacob
Registration No. 25,154
Attorney for Applicants

MJ/jef
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
October 28, 2002

VERSION WITH MARKINGS TO SHOW CHANGES MADE

4. (**Amended**) The process as claimed in claim [4] 3, wherein the solvent used is methanol, ethanol, propanol, isopropanol, ethylene glycol, propylene glycol, formamide, N-methylformamide or dimethylformamide.

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The paragraph beginning at line 26 on page 3 through line 26 on page 4 of the specification has been rewritten as follows:

Accordingly, substrates which may be used are the following compounds: olefins which contain one or more, i.e. up to 10, preferably up to 6, particularly preferably up to 4, C=C double bonds; electron-rich aromatics, such as C₆-C₃₀, preferably up to C₃₀, particularly preferably up to C₂₀, phenols, polyalkylbenzenes, polyalkoxybenzenes; polycyclic aromatics having 2 o 10, preferably up to 6, particularly preferably up to 4 aromatic rings; sulfides, such as, for example, alkyl sulfides, alkenyl sulfides, aryl sulfides which are either mono- or disubstituted on the sulfur atom, and heterocycles having an O, N or S atom in the ring, such as, for example, C₄-C₅₀, preferably up to C₃₀, particularly preferably up to C₂₀, furans, C₄-C₅₀, preferably up to C₃₀, particularly preferably up to C₂₀, pyrroles, C₄-C₆₀, preferably up to C₃₀, particularly preferably up to C₂₀, thiophenes. In this connection, the substrates may have one or more substituents, such as halogen (F, Cl, Br, I), cyanide, carbonyl groups, hydroxyl groups, C₁-C₃₀, preferably up to C₃₀, particularly preferably up to C₂₀, alkoxy groups, C₁-C₅₀, preferably up to C₃₀, particularly preferably up to C₂₀, alkyl groups, C₆-C₅₀, preferably up to C₃₀, particularly preferably up to C₂₀, aryl groups, C₂-C₅₀, preferably up to C₃₀, particularly preferably up to C₂₀, alkenyl groups, C₂-C₅₀, preferably up to C₃₀, particularly preferably up to C₂₀, alkynyl groups, carboxylic acid groups, ester groups, amide groups, amino groups, nitro groups, silyl groups, silyloxy groups, sulfone groups, sulfoxide groups. In addition, the substrates may be substituted by one or more NR¹R² radicals in which [R¹ [sic]] R¹ or [R₂ [sic]] R² may be identical or different and are H; C₁-C₅₀, preferably up to C₃₀, particularly preferably up to C₂₀, alkyl; formyl; C₂-C₅₀, preferably up to C₃₀, particularly preferably up to C₂₀, acyl; C₇-C₅₀, preferably up to C₃₀, particularly preferably up to C₂₀, benzoyl, where R¹ and R² may also together form a ring, such as, for example, in a phthalimido group.

The paragraph beginning at line 26 on page 4 through line 8, page 5 of the specification has been rewritten as follows:

Examples of suitable substrates are: 2-butene; isobutene; 2-methyl-1-butene; 2-hexene; 1,3-butadiene; 2,3-dimethylbutene; $\Delta^{9,10}$ -octalin [D^{9,10}-octalin [sic]], 2-phthalimido-4-methyl-3-pentene; 2,3-dimethyl-1,3-butadiene; 2,4-hexadiene; 2-chloro-4-methyl-3-pentene; 2-bromo-4-methyl-3-pentene; 1-trimethylsilylcyclohexene; 2,3-dimethyl-2-butenyl-*para*-tolylsulfone; 2,3-dimethyl-2-butenyl-*para*-tolyl sulfoxide; *N*-cyclohexenylmorpholine; 2-methyl-2-norbornene; terpinolene; α -pinene; β -pinene; β -citronellol; ocimene, citronellol; geraniol; farnesol; terpinene; limonene; *trans*-2,3-dimethylacrylic acid; α -terpinene; isoprene; cyclopentadiene; 1,4-diphenylbutadiene; 2-ethoxybutadiene; 1,1'-dicyclohexenyl; cholesterol; ergosterol acetate; 5-chloro-1,3-cyclohexadiene; 3-methyl-2-buten-1-ol; 3,5,5-trimethylcyclohex-2-en-1-ol; phenol, 1,2,4-trimethoxybenzene, 2,3,6-trimethylphenol, 2,4,6-trimethylphenol, 1,4-dimethylnaphthalene, furan, furfuryl alcohol, furfural, 2,5-dimethylfuran, isobenzofuran, dibenzyl sulfide, (2-methyl-5-*tert*-butyl)phenyl sulfide, etc.

The paragraph beginning at line 25 on page 9 through line 5 on page 10 of the specification has been rewritten as follows:

At 35°C, 45 μ l of H₂O₂ (50%) were added to a solution of 325 μ l of α -terpinene and 48.5 mg of Na₂MoO₄·2H₂O in 4 ml of methanol. Five further 45 μ l portions of H₂O₂ (50%) were added to this mixture as soon as the red-colored reaction mixture turned yellow again. After 1.5 hours, the reaction [mixtures [sic]] mixture was analyzed by means of HPLC. Analysis gave a quantitative formation of ascaridol.

IN THE CLAIMS:

Claims 1 to 3 have been amended as follows:

1. (Amended) A process for the oxidation of organic substrates by means of ¹O₂, which comprises adding 30-70% strength H₂O₂ to hydrophobic organic substrates which react with ¹O₂ in an organic solvent in the presence of a [heterogene us r] homogeneous catalyst,

whereupon, following the catalytic decomposition of H_2O_2 to give water and $^1\text{O}_2$, oxidation to give the corresponding oxidation products takes place.

2. **(Amended)** The process as claimed in claim 1, wherein the substrates which react with $^1\text{O}_2$ used are olefins which contain 1 to 10 C=C double bonds; $\text{C}_6\text{-C}_{50}$ phenols, polyalkylbenzenes, polyalkoxybenzenes; polycyclic aromatics having 2 to 10 aromatic rings; alkyl sulfides, alkenyl sulfides, aryl sulfides which are either mono- or disubstituted on the sulfur atom, and $\text{C}_4\text{-C}_{60}$ heterocycles having an O, N or S atom in the ring, which may be unsubstituted or may be mono- or polysubstituted by halogens, cyanide, carbonyl groups, hydroxyl groups, $\text{C}_1\text{-C}_{50}$ alkoxy groups, $\text{C}_1\text{-C}_{50}$ alkyl groups, $\text{C}_6\text{-C}_{50}$ aryl groups, $\text{C}_2\text{-C}_{50}$ alkenyl groups, $\text{C}_2\text{-C}_{50}$ alkynyl groups, carboxylic acid groups, ester groups, amide groups, amino groups, nitro groups, silyl groups, silyloxy groups, sulfone groups, sulfoxide groups or by one or more NR^1R^2 radicals in which $[\text{R}_1 \text{ [sic]}] \text{R}^1$ or $[\text{R}_2 \text{ [sic]}] \text{R}^2$ may be identical or different and are H; $\text{C}_1\text{-C}_{50}$ alkyl; formyl; $\text{C}_2\text{-C}_{50}$ acyl, $\text{C}_7\text{-C}_{50}$ benzoyl, where R^1 and R^2 may also together form a ring.

3. **(Amended)** The process as claimed in claim 1, wherein the solvent used is $\text{C}_1\text{-C}_8$ -alcohols, formamide, N-methylformamide, dimethylformamide, sulfolane[,] or propylene carbonate.